Mathematics and Computer Science Department
College of Science and Technology
Grambling State University

Course Syllabus
Math 148 - 2– Precalculus II (CRN # 10772)

Required Text: Narasimhan, Revathi, *Precalculus : Building Concepts and Connections*, Houghton Mifflin, 2009

Materials: Textbook, scientific calculator, notebook .

Course Description:

Partial fractions; analytic geometry; right triangle trigonometry; trigonometry; trigonometric functions; trigonometric identities and equations; applications of trigonometry; polar coordinates; complex numbers and vectors. Special projects.
Prerequisite: A grade of "C" or better in Math 147.

I. **Rationale**:
The purpose of this course is to provide the necessary skills (in trigonometry) to enable the student of natural sciences, engineering, and mathematics to solve equations and problems involving angles and triangles. Trigonometry involves the study of triangles and the relationships of angles and sides of triangles. Trigonometry has applications to calculus, physics, engineering, and most other scientific and technological fields

II. **Competencies**
At the end of this course the student should be able to:

A. Find the partial fraction decomposition of a rational expression.
B. Convert from radians to degrees and vice versa.
C. Solve right triangles for missing parts.
D. Determine the trigonometric functions of any angle.
E. Construct the graphs of the trigonometric functions and analyze them.
F. Evaluate the inverse trigonometric functions of a number.
G. Learn and use the basic fundamental identities to prove that other equations are identities.
H. Solve trigonometric equations.
I. Learn and apply sum and difference identities.
J. Learn and apply multiple-angle and product-sum formulas.
K. Learn and apply the Law of Sines formula.
L. Learn and apply the Law of Cosines formula.
M. Learn and apply DeMoivre's Theorem
N. Add, subtract, and find the magnitude and direction of a vector.
O. Find the dot product of two vectors and vector components.
P. Perform operations on matrices and solve systems of equations.
Q. Determine the inverse of a square matrix and find the determinant of a square matrix.
R. Learn and apply hyperbolic trigonometric functions.

III. **Behavioral Objectives**
At the completion of this course the student will be able to do:

A. Write the partial fraction decomposition of a rational expression.
B. Change an angle in radians to degrees and vice versa.
C. Solve a right triangle for its missing parts.
D. Find the value of a trigonometric function of an angle.
E. Graph the sine and cosine functions and determine their amplitude, period and phase shift.
F. Graph the other trigonometric functions.
G. Evaluate the inverse trigonometric function of a number.
H. Prove trigonometric identities.
I. Expand expressions using multiple-angle formulas and product-sum formulas
J. Use the Law of sines and cosines to solve oblique triangles.
K. Use DeMoivre's Theorem to find powers of complex numbers.
L. Find the sum and difference of vectors; find the magnitude and direction of a vector.
M. Find the components of a vector and the dot product.
N. Add, subtract, and multiply matrices.
O. Find the determinant and the inverse of a square matrix.
P. Solve a system of linear equations by substitution and by elimination.
Q. Evaluate the hyperbolic functions of an angle.

IV. Course Content

A. Trigonometric Functions
   1. Radian and Degree Measure
   2. Trigonometric Functions: The Unit Circle
   3. Right Triangle Trigonometry
   4. Trigonometric Functions of any Angle
   5. Graphs of Sine and Cosine Functions
   6. Graphs of other Trigonometric Functions
   7. Inverse Trigonometric Functions

B. Analytic Trigonometry
   1. Using Fundamental Identities
   2. Verifying Trigonometric Identities
   3. Solving Trigonometric Equations
   4. Sum and Difference Formulas
   5. Multiple-Angle and Product-Sum Formulas

C. Additional Topics in Trigonometry
   1. Law of Sines
   2. Law of Cosines
   3. DeMoivre's Theorem

D. Augmented Topics
   1. Vectors in the plane
   2. Vectors and Dot Products
   3. Matrices and Systems of Equations
   4. Operations with Matrices
   5. The Inverse of a Square Matrix
   6. The Determinant of a Square Matrix
   7. Introduction of Hyperbolic Functions

E. Topics in Analytic Geometry
   1. Introduction to Conics: Parabolas

2. Ellipses
3. Hyperbolas
4. Rotation and System of Quadratic Equations
5. Parametric Equations
6. Polar Coordinates

V. **Learning Activities**

Learning activities include lectures, problem-solving sessions; scientific and graphing calculator usage

VI General Requirements (Turn off cell phones!)

- All relevant GSU policies and regulations shall apply. Per Student Handbook, violation of student code can lead to disciplinary action (expulsion). These include but not limited to, dishonesty, profanity, obscenity, verbal assault, aiding and in-sighting.

- An "I" grade will only be given when extremely adverse and well-documented circumstances arise at the end of semester. That definitely does not include making up for weak performance during the semester. In particular, the grade that the student had made until getting an "I" will still be included into computing the final grade after the student has completed the work necessary to alter the "I" grade.
- Cheating will not be tolerated in any form. As a minimum, students will be given a grade of zero for any quiz or exam in which cheating, fraud, or mis-representation is found.
- There may be extra credit work assigned in a form of individual research project presentation.

- Class participation includes but not limited to coming to class on time, being awake in the class, and not distracting other students from listening to the class lecture, and asking relevant questions. Class discussion will be highly encouraged. Please never hesitate to ask the questions.
- The course requires lot of hard work and additional reading. Students should carefully consider this in planning their other courses and activities. Attendance in all the classes is vitally important since class lectures have a close link with each other.

VII Evaluation process

A. Methods:

Class attendance is <u>required.</u> <u>All students</u> are expected to attend. No student is expected to disrupt class.

Students will be evaluated based on their performance in examinations (including comprehensive final examination), quizzes, homework, and class participation. The details are as follows:

Attendance at Lectures:

- . You are responsible for everything covered in lecture, even if it isn't in the book. If you miss a lecture, you should obtain notes from another student. Note-taking styles vary widely, however, and I encourage you not to routinely rely on the notes of others. You are also responsible for announcements made during lecture concerning the content and types of problems to be expected on exams.

  Examinations: There will be four major tests, a midterm exam and a cumulative final examination. All students are required to take every test as scheduled. **No makeup tests will be given unless arranged for in advance(see more below).** The makeup test should be arranged within a week since the original date scheduled. The official excuse is required to take the makeup test. No more than one makeup test per student will be allowed during the semester.

  Quizzes: There will be several unannounced quizzes throughout the semester. There will be no makeup for the quizzes. Quizzes might be given at any time during the class period **and last approximately 5 minutes. Arriving at class promptly is important.**

  Special Projects: There will be group research project presentations.

  Acceptable excuses are participation in an activity appearing on the university **authorized activity list**, death or major illness in a student's immediate family, illness of a dependent family member, participation in legal proceedings or administrative procedures that require a student's presence, religious holy days, illness that is too severe or contagious for the student to attend class (to be determined by Health Center or off-campus physician), required participation in military duties. **You must provide adequate documentation for your excuse**
- In general, only one make-up exam will be scheduled for all for a missed exam. **Make exams will typically be slightly harder than regular exams**.

  Assignments: Homework assignments are extremely important. They can really make the subject material extremely clear and prepare you for tests and quizzes. During each class period, homework will be assigned and it is expected that each student will complete it as much as possible. If there are any questions, you can come and see me during my conference hours or make an appointment. First several minutes of lecture period will be utilized to answer questions regarding homework assignment. If you do your homework assignments regularly and conscientiously you will really benefit from the course a lot. I will able to cover more material in the class and this, in turn, will provide you rewarding experiences in your other courses.

  Class Participation: Class participation includes but not limited to coming to class on time, being awake in the class, and not distracting other students from listening to the class lecture, and asking relevant questions. Class discussion will be highly encouraged. Please never hesitate to ask the questions.

B. Grading Scale:

Quizzes& Homework	20%
Tests	40%
Midterm Exam	15%
Special Projects	5%
Final Exam	20%
TOTAL	100%

EXAMINATION DATES

Test 1	**Friday, September 4, 2009**
Test 2	**Friday, September 25, 2009**
MIDTERM	**FRIDAY, OCTOBER 9, 2009**
Test 3	**Friday, October 30, 2009**
Test 4	**Friday, November 20, 2009**
FINAL EXAM	**TUESDAY, DECEMBER 8, 2009. TIME: 8:00 AM - 10:00AM**

GRADING

The mid-semester and final examination will be cumulative
The Final grade will be determined on the basis of total average at the end of the semester using the
following scale:

90 - 100	**A**	**Excellent**
80 - 89	**B**	**Above Average**
70 – 79	**C**	**Average**
60 – 69	**D**	**Below Average**
0 - 59	**F**	**Fail**

The following clause is for students participating in any GSU extra curricula activity.

Any student participating in extra curricular activities (example band, football, track, etc. …) must bring signed verification from activity's sponsor/ director on or before the third week of school. Notification of scheduled events that conflict with test or assignment dates must be given in advance so that test may be rescheduled. Test or assignments may be rescheduled to an earlier date than the scheduled date, but must be completed prior to the next class period. ***If the student neglects to give early notification a score of Zero (0) will be given for that test or assignments***. **An official excuse for student participation is required to makeup an assignment**

VIII. Resolution of Concern(s) and Problem(s)

If you have any concern(s)/problems(s) regarding any aspect of the course, please discuss it **FIRST** with the instructor **AND THEN** with the Dept. Head, Dr. Brett Sims, Tel. No. 274-6177, if necessary.

Again, if you need accommodation in this class/setting/facility related to a disability, please make an appointment to see me as soon as possible